The role of state, national and international agencies in controlling exotic animal diseases

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Foreign animal diseases are an ever–present threat to the United States. As just a few examples, a massive epidemic of highly pathogenic avian influenza occurred in Pennsylvania in 1983 to 1984, screwworms were found in a horse in Florida in 2000, rabbit hemorrhagic disease was seen in rabbits in Iowa in 2000 and in Utah, Montana, and Illinois in 2001, and exotic Newcastle disease was found in poultry in California, Nevada, and Texas in 2003. During most foreign animal disease outbreaks, the exotic disease is successfully eradicated. However, the West Nile virus, which entered the U.S. in 1999, now appears to have become established in the country. If, or when, the next foreign animal disease outbreak occurs in the U.S., a unified force consisting of local veterinary practitioners, industry members, state agencies, and federal agencies must be ready to implement an emergency response in order to contain and eradicate the disease as quickly as possible. Our best defense is increased awareness and preparedness so that a foreign disease can be recognized at first blush and immediately eradicated.

Protecting Against a Foreign Animal Disease

The primary responsibility for protection against foreign animal diseases is assigned to the Animal and Plant Health Inspection Service (APHIS), which is an agency of the USDA. APHIS manages import testing and quarantine, diagnostic testing, training of field forces for detection, and eradication guidelines. Agriculture border controls were maintained by Plant Protection and Quarantine, but as of March of 2003, these responsibilities were transferred to the newly created Department of Homeland Security, Customs and Border Protection (CBP). CBP officials work closely with personnel in PPQ and Veterinary Services to insure appropriate application of APHIS regulations, policies, and guidelines. CBP inspectors are responsible for monitoring all ports of entry and are constantly on the lookout for imported animal and plant material. Their jobs have been considerably improved through the use of the Beagle Brigade, a cadre of Beagles trained to smell animal and plant material within luggage.

Import testing is done at the National Veterinary Services Laboratories, at Ames, Iowa and Plum Island, New York. Each facility is responsible for specific diseases: Ames is responsible for all poultry and equine diseases as well as TSEs. Vesicular and other highly contagious FADs are diagnosed at Plum Island. Animals imported from a country that has endemic List A diseases must follow strict import protocols for testing. Imported animals must follow quarantine procedures. .

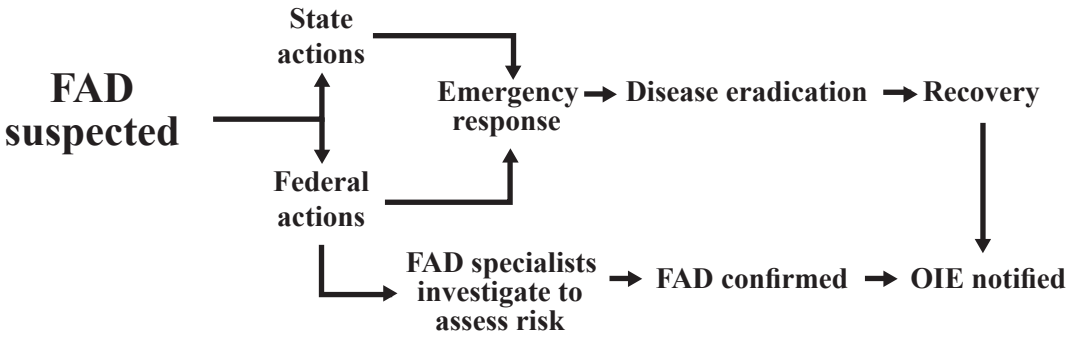
The National Animal Health Emergency Management System (NAHEMS) is a joint state–federal–industry effort to improve the United States' ability to deal successfully with animal health emergencies. APHIS and state veterinarians are constantly on the lookout for approximately 50 different foreign animal diseases. APHIS has trained roughly 400 "foreign animal disease diagnosticians" or FADDs, who have been through a course on foreign animal diseases at Plum Island. These FADDs may be federal, state or university-affiliated veterinarians and are the ones designated to travel to the field site of a suspected foreign animal disease to assess the situation and take appropriate samples for laboratory testing. In the event of a diagnosis of a foreign animal disease, APHIS has a defined plan of eradication for each disease.

The Response to a Foreign Animal Disease

For the veterinary practitioner, an apparently predictable day of farm calls or office visits could become anything but ordinary when he or she suspects a highly transmissible foreign animal disease in a client's flock, herd, or pet based on the history, signalment, lesions, and clinical signs.

Professionals at the local level are the first line of defense against the spread of a FAD. Recognition of suspicious cases and subsequent rapid reporting to state or federal authorities is the most critical step of a disease control program. Practicing veterinarians have historically been the first to come in contact with or suspect a foreign animal disease outbreak. They represent a large force of educated individuals in daily contact with our nation's livestock, poultry, and companion animals. Veterinary diagnostic laboratories are also common sites of initial detection of a FAD. If the practitioner or diagnostic laboratory feels there may be the possibility of a foreign animal disease, the first step is to contact either the State Veterinarian's office or the APHIS Area–Veterinarian–in–Charge (AVIC). This will initiate a cascade of state and federal actions to identify the disease and, if necessary, implement a control and eradication process.

Chart: Steps taken to control a FAD outbreak



Once a suspicion of a foreign animal disease has been raised, notification is passed on to either state or federal authorities. Whichever is notified first immediately notifies the other. With respect to foreign animal diseases, federal and state entities operate in tandem on all diagnostic and control issues. It is a system with recurring redundancy and considerable synergy that takes into account all aspects of federal authority and states' rights inherent within our legislative framework.

State actions

Each state is interested in protecting its producers, consumers, agriculture products, and export markets. For this reason, each state's Department of Agriculture is active in risk assessment and establishing a cooperative emergency response plan. Individual states differ in the emergency response systems they have established in the event of an animal health crisis. In Georgia, declaration of an animal health emergency would activate the Georgia Emergency Management Agency (GEMA). This would make accessible to the State Department of Agriculture the same resources that any other disaster would trigger. Whether a state has a specific animal emergency response system or not, USDA APHIS officials will be involved to ensure that the appropriate response to the disease is carried out in the affected area, in the surrounding regions, and nationwide.

If a FAD is suspected, the State Veterinarian is immediately notified by local professionals or the federal authorities. The State Veterinarian consults with federal authorities and a foreign animal disease diagnostician is assigned to the case. As the investigation continues, information on the evolving case is reported to the State Veterinarian and to federal authorities. Further state actions will depend on several factors such as the type of FAD, the species it affects, the degree of transmission, state agriculture and industry concerns, economic impacts, and results from risk analyses. For example, Georgia is the largest producer of broiler chickens and table eggs in the U.S. A suspected outbreak of highly pathogenic avian influenza would spark a much different and more urgent response than a suspected case of rabbit hemorrhagic disease. State activities differ from federal activities in that grassroots concerns exert greater pressure on state actions. The US Constitution only empowers the Federal government to intervene in foreign commerce and in interstate commerce. The Federal government does not have any jurisdiction in quarantine and control measures for animal diseases in a given state, until and unless the U.S. Secretary of Agriculture has declared an animal disease emergency. At that point, and only then, the Federal government is given jurisdiction to impose quarantines inside a given State.

Federal actions

Each year, APHIS oversees approximately 500 foreign animal disease investigations. The overwhelming majority prove to be negative. However, each potential outbreak must be thoroughly investigated or the consequences could be devastating. These investigations are overseen by the APHIS AVI C. An AVIC supervises each state or group of states and is responsible for federal coordination of animal health issues in that area. The AVIC for the affected state is notified along with the State Veterinarian of a suspected foreign animal disease. The AVIC, in consultation with the State Veterinarian, assigns a foreign animal disease diagnostician to investigate the disease. Industry specialists and university faculty often assist in the initial investigation of a suspected FAD outbreak; they may include epidemiologists, pathologists, microbiologists, species specialists, and wildlife biologists. If an emergency eradication program is activated, the aforementioned professionals, local authorities, producers, marketers, and industry act in cooperation with state and federal agencies to assist with the emergency response.

FAD specialists investigate to assess risks

A FADD is a State Department of Agriculture, USDA, or university affiliated veterinarian who has received training in the detection of FADs and the collection of appropriate samples for diagnosis. The FADD must be at the affected premises within 6 to12 hours of notification and is responsible for making an assessment about the disease possibilities as well as collecting and packaging all requisite samples to send to the laboratory. The samples are sent via the fastest means possible to either the National Veterinary Services Laboratories (NVSL) in Ames, Iowa or to the Foreign Animal Disease Diagnostics Laboratory (FADDL) at Plum Island, New York. All vesicular disease suspect samples must go to FADDL at Plum Island. Most of the other suspicious cases go to the NVSL in Ames. If the suspicion of a vesicular disease is very high, the FADD may personally courier the samples to the Plum Island laboratory. Prior to leaving the farm, the FADD works with the producer to establish appropriate biosecurity measures to ensure that all clothing, equipment, and vehicles are thoroughly cleaned and disinfected before leaving the premises. The FADD will relay his or her findings and classification of the case to the State Veterinarian and AVIC. If necessary, an Early Response Team (ERT), composed of a senior FADD, a senior pathologist familiar with FADs, a species specialist, and a senior epidemiologist, is formed to assist the FADD with the investigation.

With a presumptive positive FAD outbreak, the State Veterinarian, the APHIS AVIC, and the FADD meet to discuss and implement appropriate

control measures including a state quarantine of the premises, surveillance, and the initiation of steps to characterize and control the outbreak. A presumptive positive case is assumed when the clinical signs or epidemiological information are indicative of or consistent with a FAD introduction. Actions undertaken with a presumptive positive outbreak occur while blood and tissue samples collected by the FADD are analyzed at the NVSL or FADDL. The NVSL or FADDL will confirm the presence or absence of disease, but definitive tests may take up to two weeks. The APHIS Emergency Management Operations Center is also activated and all the players in the emergency management system are notified and prepared for deployment.

Confirmation of a foreign animal disease outbreak

If a positive identification of a foreign animal disease agent is made on a specimen in the laboratory, an outbreak of the disease is declared. At this point, federal and state teams become fully activated and begin a coordinated effort to control and eradicate the FAD. At the same time, federal authorities notify the OIE of the situation. The OIE has established a warning system allowing its member countries to take rapid action should the need arise. Within 24 hours of confirmation of an outbreak of any infectious disease that could have serious repercussions on public health or on the economy of animal production, the U.S., as a member country of the OIE, is bound to report it to the OIE Central Bureau. The Central Bureau immediately disseminates the information to its member nations; at this time, export bans may be imposed on U.S. animal or animal products. In addition, the chief veterinary officer of the U.S. makes courtesy telephone calls to our major trading partners as well as our two closest geographic neighbors to notify them of the situation.

An emergency response is initiated

Once there is confirmation of a FAD from the NVSL or FADDL, both state and federal agencies work together to implement steps to control the outbreak. The Secretary of Agriculture may declare an emergency, which allows for federal funds and cooperation from other federal agencies to control and eliminate the disease. Federal agencies such as the Department of Defense and the Federal Emergency Management Agency (FEMA) may assist if needed to fight a national disease outbreak. The Incident Command System (ICS) is activated by APHIS to coordinate all federal, state, and local emergency responses. The ICS is composed of veterinarians, technicians, disease specialists, and administrative and clerical personnel. These individuals may be employed by the federal or state governments, universities, the military, or industry, or may be private practitioners.

The immediate concerns of the Incident Command System (ICS) include:

What do we do with the infected herd/flock?
How do we eradicate the disease (depopulate, vaccinate)?
What is the best means of carcass disposal?
What is the extent of the outbreak?
From where did the outbreak originate?

At the same time, if the state has an established emergency response plan, it is activated by the State Veterinarian. A statewide quarantine is implemented and all movement of susceptible livestock is halted. The state secretary/commissioner of agriculture and the governor are notified as well as state emergency management and possibly public health officials. If it is deemed necessary, the State Veterinarian can request that the state governor declare a state of emergency, which would make state assets and authorities available for depopulation activities, carcass disposal, enforcement of quarantines and transport restrictions, cleaning and disinfection of affected premises, and other ancillary duties.

The search for additional active cases and intensive epidemiological investigations extend to all agricultural sites within a specified control zone. Depopulation of infected herds begins immediately. State wildlife officials are consulted to determine susceptible wildlife populations and the risks associated with the introduction of the FAD into this population. Each moment throughout the emergency response brings new information regarding the extent and spread of disease, status of the eradication program, industry concerns, resources expended, and public opinion. An ideal response must be effective, yet flexible enough to address ever–changing needs and concerns. The strength and success of an emergency plan depends on preparedness, a cooperative effort, swift implementation, and clearly defined roles and authorities. The greatest priority is to return the U.S. to disease–free status as soon as possible.

Disease eradication

In the United States, a foreign animal disease is usually eradicated by depopulation. After an outbreak is confirmed, state and federal agencies, coordinated through the ICS, act quickly to cull infected and exposed herds or flocks. Indemnity is established for the fair market value of the animals. Funding for the eradication program is initially provided by the State Department of Agriculture and state emergency funds. If the outbreak escalates and the secretary of the USDA declares an emergency, federal funds are authorized to cover the expense of eradication. State contingency funds cover the costs to producers and industry that are not covered by federal sources.

Several considerations must be made regarding depopulation and disposal of the carcasses. The procedures must not allow for the further spread of the agent and animals are to be humanely handled and euthanized. Burial is the preferred method of disposal for carcasses, animal products, feed, and organic wastes since it is relatively easy, requires fewer resources, and is quick. In some instances, burial is not possible due to topography, water table depth, or available space. In this case, alternatives such as incineration, rendering, composting, and alkaline hydrolysis are considered. Vaccination programs may be utilized in certain FAD outbreaks to enhance eradication activities, decrease the severity of the outbreak, or help insulate disease–free areas from affected regions.

Additional quarantines and restrictions may be imposed as the extent of the outbreak is unveiled. Other federal agencies, such as the Department of Defense and the Federal Emergency Management Agency, may be called in to work within the ICS to help in the containment and eradication efforts. Epidemiological investigations continue in an effort to trace back all possible exposures, and other active cases are sought out utilizing accredited veterinarians, the USDA Food Safety and Inspection Service, the Cooperative Extension Service, industry partners, and public awareness campaigns. Throughout the eradication process, the OIE, state, and federal officials are continually apprised on progress and disease status. As the outbreak evolves, quarantine and surveillance are adjusted as needed, epidemiological investigations are used to determine the route of spread and the connection between infected premises, eradication options are reviewed, manpower and equipment needs are adjusted, and environmental, media, legal, and public concerns are handled by appointed specialists.

Once the outbreak appears to be under control, APHIS continues to assess the situation and works to regionalize any remaining affected areas. This allows animals outside the affected areas to be classified as disease–free, allowing the resumption of animal transport. APHIS will consult with agricultural officials in other countries about the status of the disease outbreak, biosecurity issues, monitoring, and containment programs to insure that our trading partners will not place unnecessary restrictions on the export of disease–free animals. Determining whether the disease is truly gone is one of the most difficult aspects of an eradication program. Surveillance will need to continue until our international trading partners once again recognize the nation as disease–free as recommended by the OIE's International Animal Health Code. By the end of an outbreak, millions or possibly billions of dollars have been lost to trade restrictions imposed on U.S. animals and animal products. Millions can be spent containing, characterizing, and eradicating the outbreak. Potentially tens of thousands of animals may be destroyed and extensive surveillance must be continued to ensure that the disease is eradicated and is not harbored in wildlife.

Conclusion

Important points for veterinarians to remember:

Veterinarians need to be sensitive to their crucial role in protecting the U.S. from a foreign animal disease. As mentioned previously, rapid detection and reporting of suspicious cases provides the greatest opportunity for control and eradication of a foreign animal disease.

The veterinarian also has a responsibility to ensure that he or she doesn't unknowingly spread disease by neglecting simple biosecurity practices. Set an example to your clients, employees, and peers by taking the proper measures to safeguard your patients from transmissible diseases. Routinely clean and disinfect examination tables and equipment between patient visits and institute a good policy of hand washing before handling patients. When visiting a farm or other animal facility, wear clean coveralls and boots that can be properly disinfected.

To be effective, an emergency response program must utilize all available resources and have the flexibility to evolve with an outbreak scenario. A major portion of the development of an emergency plan is to determine and maintain contacts and cooperative agreements between local, state, and federal agencies in addition to industry specialists, species specialists, animal health specialists, and wildlife biologists.

Remember that the risk for a FAD in our nation is increasing due to rising international travel, growing ethnic populations and diversity in the U.S., and intensive agriculture practices. Veterinarians should be suspicious of signs consistent with a FAD or confounding cases. These unusual cases may be evidence of an emerging disease. Report, report, report! APHIS has the advantage of a big, nationwide picture and may be able to detect trends and/or emerging diseases.